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THE BIRDS OF GREAT YARMOUTH AND THE NEIGHBOURHOOD.

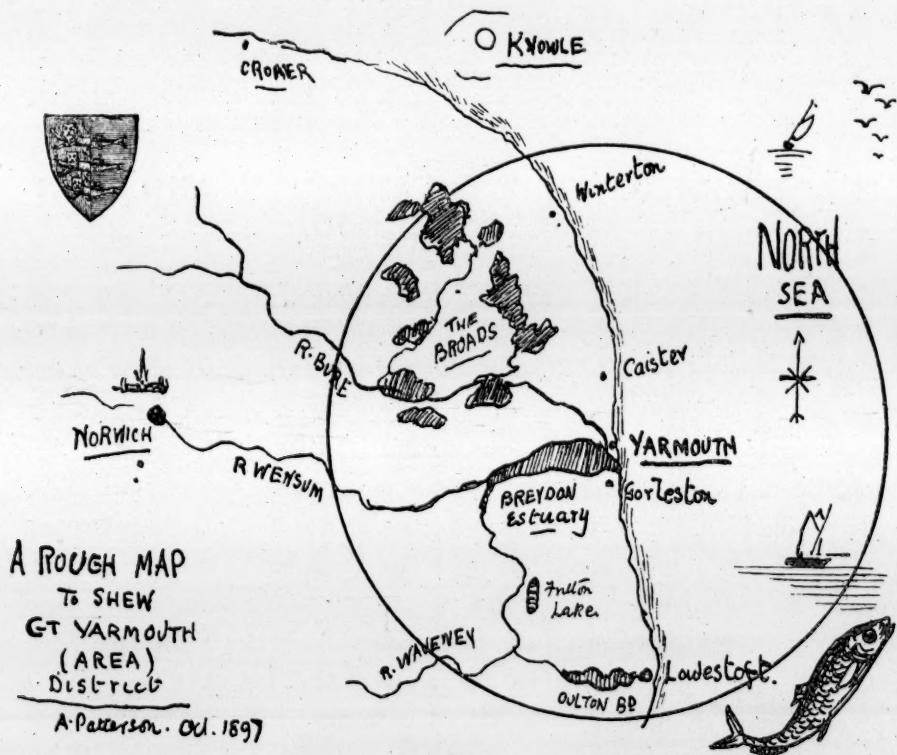
BY ARTHUR PATTERSON.

THE aspects of bird-life in the Great Yarmouth district are exceedingly interesting, and must have been peculiarly so in the earlier part of the century, prior to the improved drainage of the marsh-lands, the encroachments of the sportsman, the agriculturist, and the builder, the advent of railways, and many other untoward circumstances. The Rev. Richard Lubbock, in the introduction to his 'Fauna of Norfolk,' truly remarks: "We everywhere find the spirit of civilization and improvement warring with the *feræ naturæ*." In a note written by him in 1847* he says:—"Since I first began to sport, about 1816, a marvellous alteration has taken place in Norfolk, particularly in the marshy parts. When first I remember the fens they were full of Terns, Ruffs, and Redlegs; and yet the old fenmen declared there was not a tenth part of what they remembered when boys. Now these very parts which were the best . . . are totally drained . . . dry as a bowling-green, and oats are grown where seven or eight years back *one hundred and twenty-three* Snipes were killed in one day by the same gun." Mr. Southwell goes on to speak of a dry pasture pointed out to him by the late Mr. Rising, at Horsey,

* *Vide Lubbock's 'Observations on the Fauna of Norfolk,' new ed. 1879, p. iii, Introduction, by T. Southwell, F.Z.S.*

which, in his father's time, "was a swamp whereon many thousands of Black-headed Gulls nested every summer; the marshes at that time swarming with Bitterns, Grebes, Ruffs, and Avocets."

No true naturalist can look upon these gradual but inevitable alterations and changes without experiencing feelings of profound regret; but, as the needs and gratifications of the many are ever superior to the sentiments and delights of the few, the naturalist must be content to accept the inevitable.



As, roughly speaking, a ten-mile radius has been kept to in covering the area of the Yarmouth district, Horsey comes within the northern boundary. But what may be said of the changes apparent there may well apply all round: the marsh-lands support herds of cattle where once the waterfowl dotted the swamp, dwelling-houses have supplanted furze-bushes, and visitors, other than avine, monopolize the sands. There is, however, no branch of natural history which can still be pursued to such advantage around Yarmouth as ornithology. It formerly was, and still is, without a doubt, one of the richest districts in England for birds



of the wading and swimming classes; its easterly position, the open, exposed, and varied nature of the locality, with its wealth of marsh-land, its spread of waterways, and extensive warrens, offer unusual attractions to those species which may be collectively termed wildfowl. The list which follows will amply support this statement.

Northwards for many miles stretches an array of sadly diminishing sand-hills, or undulating knolls and ridges of blown sand, held together by the roots of the marram grass (*Ammophila arundinacea*), the sand-sedge (*Carex arenaria*), *Ononis spinosa*, and various other deep-rooting dune-plants interesting to the botanist, and in whose seeds, laid bare by the winds of autumn, migratory Buntings and Finches find an abundant supply of food. In turn these sand-dunes have attractions for the Sand-Grouse, the Dotterel, the Great Snipe, and others.

Nearer the town the sand-hills have been levelled in recent years, and are fronted by a sea-wall and macadamized road, which extends parallel for some distance to the once celebrated North Denes, at one time an extensive area of rounded and broken sand-heaps, covered with acres of furze, now extirpated, and given over to the golfer. A railway runs through the centre of them, and the town keeps slowly creeping northwards beside it. Up to the end of the seventies the Whinchat, Stonechat, Linnet, Wheatear, and even Partridges nested in the whins; the Wood-Pigeon, Turtle-Dove, Stock-Dove, and Mistle-Thrush came in flocks in summer to feed here. At Caister and beyond, the sand-hills become higher, and the vegetation more varied, the brake, broom, and sea-buckthorn being conspicuous; and Rabbits abound. The beach below presents a long monotonous level of clear firm sand, sparsely "shingled" or pebbled, with few tide-pools; spring tides cover the sands almost to the sand cliffs. Until within the past year or two a few Ringed Plovers have persevered in nesting among the higher patches of shingle, the site chosen being a depression probably caused by a horse's hoof, the bottom of which is usually lined with small pieces of shell or thin white chalky stones. Constant traffic has banished this bird, the only species known to have nested there within the memory of man. One nest was found on the south beach in 1899.

The absence of rocks and seaweeds forbids the abundance of certain fishes and Mollusca, so that the ornithologist may in some measure infer as to what particular species of birds would from choice be usually scarce or abundant. Surface-feeders are well represented, but those which dive or prey upon Mollusca, and those that delight in rocky and precipitous habitats, are generally uncommon, or merely storm-driven stragglers. An exception exists in the Scoter, numbers of which frequent the Broads all the winter, feeding upon the smaller bivalves which are apparently in spots plentiful at the bottom (*vide note on Scoter*).

The northern sand-hills mostly slope gradually into marshy levels or cultivated fields, reaching their level in the Broad-lands and the valley of the Bure.

Southwards of the town, after passing the mouth of the Yare, stretching away towards Lowestoft, is a range of crumbling sand-cliffs, the fields above which are cultivated to the very edge. A straggling colony of Sand-Martins nests here. All westward of the cliffs is cultivated, and merges off into a fairly well-wooded district, notably at Fritton and Belton, excepting which scarcely anything worthy of that name exists within the limits comprised in the district to which these remarks refer. Small thickets occur at the margins of some of the Broads, and a few carrs of alder and willow, interspersed with birch, are irregularly scattered over the swampy parts of the marshes, but seldom covering more than an acre or two of ground.

To the west of the town is the great alluvial flat, once the bed of the great estuary known to the Romans as *Garienis ostium*, and up which their galleys passed to their camp at Caistor, beyond Norwich. Remains of this estuary and the branches now exist in the famous Norfolk Broads, most noticeable of which is Breydon Water, into which the Yare, the Waveney, and the Bure empty their sluggish streams.

Before Breydon was walled* and the rivers banked, and the

* Breydon, five miles long and one in width, is surrounded by a winding mound or dyke, faced with jagged flints and backed with grass, forming a triangular barrier. The rivers are similarly confined. The ditches formed by the soil removed drain the marshes, and are connected with a network of others. Steam drainage mills pour the surplus water over into the rivers. Hence, although the marshes grow drier year by year, they are always below the level of high water.

vast stretches of marshes ditched and drained, the extensive level of swamp must have been at most hours of the tide a very paradise for the wildfowl, and those who sought them. "It would be difficult to imagine," wrote the Messrs. Paget in 1834, "a spot more suitable to their (the wildfowls') habits than Breydon affords, consisting as it does of a sheet of water some miles in extent, with shallow borders, or flats (as they are called), and surrounded, almost as far as the eye can reach, by marshes. The water leaving its banks quite bare for a considerable extent at every ebbing of the tide, exposes an abundance of the small crustaceous animals and other food most congenial to the Duck tribe. Even in the severest winters it is seldom so completely frozen over as not still to afford, in the small fish with which it abounds, and the crabs and insects about its banks, a sufficiency of provision for the fowl; and it is in such seasons that the greatest numbers are secured. Almost benumbed with cold, they flock together, and while they sit crowded up in a compact mass, to prevent the warmth of their bodies escaping, the gunner may, in his flat-bottomed boat, approach within a comparatively short distance of them by means of channels made in the flats, and with a single discharge of his gun, which moves on a swivel in the midships of his boat, effect a most extraordinary slaughter."

To-day these attractions remain much the same, but the birds are fewer. In severe spells of frost astonishing numbers of wild-fowl are occasionally seen there, when a constant fusillade is heard, the frequent sharp crack of shoulder-guns being punctuated by the louder boom of the punt-guns. During a snap of frost in December, 1899, hundreds of Wigeon, Tufted Ducks, Mallard, and other fowl, besides thousands of Dunlins, swarmed on Breydon; and Durrant's game-stall presented a remarkable appearance, covered as it was with hundreds of wild birds of various species.

Reverting again to the Pagets' 'Sketch,' an instance is related of a punt-gunner, named Thomas, "who one morning, on awaking in his boat on the flats, saw not far from him a number of wild-fowl sitting in a crowd close together on the ice. From the boat being nearly covered with snow he had escaped their observation while they were collecting in the night. He immediately fired

(his gun carrying about a pound of shot), and with those killed outright and the wounded, which he and his dog caught before they could make their escape, he secured no fewer than thirty couple of wildfowl, consisting principally of Wigeon and Teal." This same old gunner on one occasion, after considerable manœuvring to get within range, killed six Swans out of a flock of eight at one shot.

Mention is also made of a bird-preserved named Harvey (*vide* note on Pratincole), who " previous to the alteration in the game-laws" sent up to the London markets an average of about fifty fowl per week through the season—*viz.* October to April—the number varying with the severity of the weather; thus, in the winter of 1829, on one market-day, he had brought to him four hundred wildfowl of various species, five hundred Snipes, and one hundred and fifty Golden Plovers, " all of which he immediately carried up to London and disposed of."

Notwithstanding the changes which have of late years taken place in Breydon—such as the great silting up of the flats (over some acres of which now flourish field-like patches of *Salicornia herbacea*, the jointed glass-wort), and the lessening of certain species of fish, the Grey Mullet (*Mugil capito*), for instance, which now no longer ascends in shoals, while the Osprey and Cormorant are more seldom seen—most interesting glimpses into bird-life may be enjoyed. In spring large flocks of Wigeon may be observed pulling at the succulent stems of the *Potamogeton pectinatus* (local, "Wigeon-grass"), the Curlew boring deep to find the Nereid worms, and smaller species of Waders busily hunting *Gammaridae*, *Mysis vulgaris*, and other crustaceans. Herons are seldom absent, for the Shore-Crabs (*Carcinus mænas*) and the Eels and Flounders have attractions for them. In autumn various migrants, the juniors coming first, are often abundant, and various Ducks and Geese and Swans may be expected in wintry weather. And what adds much to the pleasure of a jaunt on Breydon is the possibility that you may meet with *rareæ aves* at any moment, and your delight will certainly not be lessened if your binoculars are handy. I have thus fallen in with the Siberian Pectoral Sandpiper, several Spoonbills, the Iceland Gull, and many another.

During the close season Breydon is comparatively quiet, the

local gunners having, as a rule, respect for the enforcement of the Protection Acts by the Breydon Protection Committee, who employ a watcher, and with gratifying results. The following figures, culled from the rough log-book of "Ducker" Chambers, the watcher, which has been kept by him in a most spasmodic sort of way for eleven years, will give a fairly good idea of the frequency and numbers of spring migrants visiting Breydon on their northward journey. Small migrants have been seldom noted; of course over such a vast area many birds escape identification. A careful and enthusiastic observer might compile a vastly superior list both in numbers and species.

MARCH-JUNE, 1890.

March 2nd,	1890.	200 to 300 Wigeon and Mallard.
" 5th,	"	65 Shovelers.
" 6th,	"	11 Geese.
" 9th,	"	300 Wigeon, Golden-eyes; many small birds.
May 14th,	"	60 Godwits, Whimbrel, Plovers.
" 24th,	"	Several Greenshanks and Redshanks.
" 25th,	"	6 Cormorants; several Black Terns.
June 4th,	"	4 Shelducks.
" 18th,	"	3 Bernacle-Geese.

MARCH-AUGUST, 1898.

March 8rd,	1898.	2 Swans.
" 4th,	"	3 Golden-eyes.
" 9th,	"	300 Wigeon, Pintails, Shovelers.
" 10th,	"	1000 Wigeon (about).
April 8th,	"	1 Spoonbill.
" 16th,	"	1 Swan.
May 16th,	"	700 Godwits; plenty Whimbrel, Plovers, &c.
" 24th,	"	2 Goosanders.
" 27th,	"	2 Spoonbills.
June 14th,	"	2 Spoonbills.
Aug. 12th,	"	400 Curlews.

The Broads, although slowly growing up, are still extensive. They have a beauty quite their own in their leafy setting of reeds and rushes. Of late years the rage for "doing" the Broads has banished the privacy and security which at one time characterized them. Some nesting species have disappeared, as the Bittern, the Godwit, the Black Tern, and the Ruff; whilst among some remaining a perceptible decrease is apparent, as in the case of the Bearded Tit. Many non-residents have become scarcer, although in sharp winters numbers of wildfowl drop in. The Crested Grebe fortunately appears to be on the increase.

There were at one time several decoys* in use on the various Broads, but these have of late years fallen into disuse, and are now not worked, with the exception of Sir Savile Crossley's on Fritton Lake. Mr. J. H. Gurney has kindly furnished me with the following extract from the many years' returns for this decoy in his possession :—

TAKE OF WILDFOWL AT FRITTON DECOY.

	Duck.	Teal.	Wigeon.	Shoveler.
October, 1887.....	41	17	0	0
November, „	198	14	0	0
December, „	176	2	0	1
January, 1888	121	2	2	0
February, „	133	0	0	0
March, „	6	1	5	0
	675	66	7	1

I have an entry from the 'Yarmouth Independent,' of a contemporary date, stating that on Dec. 13th, 1879, the decoymen at Fritton secured no fewer than 190 wildfowl at one pull of the net !

The following agreement for the hiring of a decoy, the very site of which appears now to have become lost, will serve to show how remunerative at one time these engines of destruction must have been :—

" Memorandum of an Agreement made this 17th day of March, 1810, between Mrs. Hannah Forder, of Rollesby, Norfolk, and her son Thomas Forder, have agreed with his mother for the use of a decoy now in her possession, from Lady-day next following it, at the Annual Rent £44 per year, and the said Thomas Forder shall at his own expense keep the same in tenantable repair ; the rent to be paid half-yearly.

" And a further agreement between Thomas and his mother Hannah Forder for all fowles and fish he can catch. The said Thomas Forder do agree to deliver the same fowl at eighteen pence per couple, and half-fowl at half-price, and from August to Michaelmas at two shillings per couple, and half-fowl at half-price, and from Michaelmas to Lady-day at three shillings per couple, and half-fowl at half-price.

* For most interesting and graphic accounts of decoys and the methods of working them, see Stevenson's 'Birds of Norfolk,' and Lubbock's 'Observations on the Fauna of Norfolk,' new edit.

"Also all Pike under three Qurters [quarters?] sixpence each, and Eels at three shillings per stone.

" HANNAH FORDER, her mark ×.

" THOMAS FORDER, his mark ×."

"Witness { John Stagg,
John Sandcroft, Jnr.

The taking of eggs was at one time carried on to a great extent, and tended undoubtedly to the diminution of certain species. "All the marshes," wrote the Messrs. Paget in 1834, "but more especially about Oby, Thurne, and Acle, are found considerably profitable, by the numbers of Plovers' eggs which may be collected in them, and of which there is carried on a most extensive sale during the months of March, April, and May. The same person (Isaac Harvey) before mentioned sends an average of between six and seven hundred eggs to the London and other markets every week during the season." The "eggs" covered a variety of species, *e.g.* Snipe, Lapwings', Redshanks', Water-Rails', Moor-hens', and Coots'. At the present time a few small chip trays of Plovers' eggs appear in Yarmouth market every spring, but, as with the wildfowl, there is but a limited local sale.

There are many features connected with the bird-life of the neighbourhood which are worthy of note, among them the extreme uncertainty of migratory movements in large bodies. In some years certain rare species have appeared in unusual numbers, as in the case of the Shore Lark, Lapland Bunting, Little Auk, Buzzards, Skuas, and others; on the other hand, years may elapse without such records. These fluctuations undoubtedly depend upon, or are affected by, atmospheric conditions; a sharp winter, with continuous occurrences of heavy gales from the north, north-east, or south-east, will drive in many species, more particularly during the periods of migration. In October the local ornithologist hails with pleasure a south-easterly breeze, with "dirty weather" in its wake. The day previous certain species will be perhaps altogether absent; at night, as the wind freshens or the drizzling rain makes the darkness dismal, he may hear their clamorous call-notes resounding overhead; the bewildered birds, unaccustomed to the glare of our gas-lamps, keep wheeling around, as if attracted by them, incessantly calling in order to keep together their respective flocks, until the day dawns, when they drop upon the Breydon mud-flats to feed and

rest, or pursue their journey. Thus the Golden Plover, the Knot, and many others are often to be met with a few hours after a shift of wind. The following "entry" from my note-book is a case in point:—

Sept. 30th, 1899.—Wind veered yesterday from south-west to south-east. Rough wet night. To-day Breydon was noisy with birds; saw some Turnstones and Whimbrel; number of Grey Plovers, some Greenshanks, and many small birds. Many scores of Grey Plovers were subsequently shot.

A similar occurrence is noted for September, 1897, as follows:—

Sept. 5th.—A "rush" of migratorial birds; wind suddenly veering to east after continuous west and south-west winds. Next day, Sept. 6th, on a game-stall, the following birds were exposed for sale:—Ten Godwits, one Shelduck, one Scaup, nine Curlew Sandpipers, one Reeve, one Greenshank, twenty Knots, two Kingfishers.

That the movements of certain birds are a fairly reliable indication that some atmospheric disturbance is approaching seems to my mind beyond dispute. Note the following entries:—

Nov. 23rd, 1897.—Extraordinary thick fog.

Nov. 24th.—Night noisy with cries of Plovers; this, with certain other birds being "uneasy," portending bad weather. (The weather changed almost immediately after.)

Nov. 28th.—Blew hard to-day (and next), the gale causing havoc all round the neighbourhood. Tide rose to an alarming height. The sea broke through the sand-hills at Horsey.

South-east winds are more favourable to the migratorial birds passing along our shores, whilst that from an opposite quarter, or from a westerly direction, will favour the Dutch coast-line, to the detriment of our own. With light north-west winds and moonlight nights, during October and November, the Woodcock is anxiously looked for. Westerly winds have been responsible for the visits of a few American wanderers—for instance, the Great Spotted Cuckoo. Severe winters, with much snow, drive numerous wanderers south, and there can be little doubt that many birds which rush ahead of hard weather have put off their exit until absolutely driven to it. In the cruel January of 1881, the day before the fearfully disastrous gale on our coast, I wit-

nessed an extraordinary immigration of small birds, amongst them many *Turdidae*, besides Redpolls and other Finches, many of which fell exhausted on landing, some taking shelter in wheel-ruts in the sand. The chirp of a Sparrow particularly caught my attention, and *Passer domesticus* was distinguished as he flew by. Redbreasts were also noted. On Feb. 2nd, 1897, Fieldfares and Redwings were arriving in continuous flocks, as if it were an ordinary October migration. On the 3rd Larks were trooping in. Coarse winterly weather followed them. On Dec. 22nd, 1894, hundreds of Lapwings were coming over against a strong north-west gale. Many were drowned.

As to birds which fall exhausted in the sea and are drowned, there can be little doubt that numbers, especially of the smaller species—*e.g.* Chaffinches, Redpolls, and many others—perish in this way when overtaken by stress of weather; but few are seen washed up on the beach. Their disappearance may be accounted for by the presence at this time of numerous Gulls on the coast, which are eager to glean up any such flotsam that is almost sure to attract their notice as they ceaselessly patrol the restless sea. A sudden change of wind to an easterly point will sometimes drive a few of these unfortunate birds ashore. On Sept. 24th, 1881, during a walk along the north beach, I observed lying among the refuse three Common Buzzards, three Sparrowhawks, and a Harrier, which, with a few common species, had been overtaken by a storm and had perished. There had been that month an unusual immigration of raptorial birds, several others having met with an untimely end in the neighbourhood. I have also found in the wash and at the tide-mark at various times Guillemots, Razorbills, Crows, Merlins, and many others that have succumbed to fatigue or the violence of the storm. On one occasion I found the remains of quite a number of Kittiwakes (*vide* note on Kittiwake). When stranded these carcases are very soon stripped by Hooded Crows, which do not scruple to dine even off defunct members of their own genus.

In some years it is extremely interesting to watch the steady influx of migrants of various species, often indicative, to my mind, of a long and severe winter ensuing. At other times migration goes on scantily or spasmodically. It was my custom for several years, when living at the north part of the town, to watch these

movements, more especially in October, keeping much to the beach and vicinity of the North Denes.* Amongst many observations made, the following few may be of interest :—I noticed that Larks were our commonest immigrants. Before daybreak their call-note might be heard as they “struck” shore. As light dawned they might be seen skimming shorewards just above the waves ; as the day wore on they gradually flew higher, till sometimes a great altitude was obtained by succeeding flocks. Larks usually fly in from direct east. Fieldfares and Redwings generally arrived from north-east. Rooks and Hooded Crows at ordinary times leisurely trooped in, flying east to west. Occasionally “ruses” of these *Corvidæ*, more particularly Rooks, strike the coast farther north, and lead along, in quick succeeding flocks, the line of trees bordering Caister road. Small birds usually do the same, Linnets, Twites, and such like keeping more to the cliffs and sand-hills, in which line of flight the bird-catchers fix their nets. Jackdaws often mix with other corvine immigrants, and invariably are noisy, except when with the “ruses” referred to. My experience leads me to believe that by the first week in November the majority of immigrants have arrived, and not till the first spell of severe weather sets in does another movement take place, and that November generally is our dullest local bird-month. Lightship men, who formerly captured many tired migrants on board, complain of a falling off in late years.

The autumn arrivals of 1899 were scanty, beyond the fairly regular incoming of Rooks, Hooded Crows, and Larks. But early in December the weather set in cold, with wind at south-east. On the night of the 6th it was squally ; the air was “alive” with cries of Golden Plover, which were plentiful on the marshes on the 8th. Snow fell on the 10th, with sharp frost ensuing. Snipe, which had hitherto been scarce, “inrushed” to the brackish ditches on the marsh-lands, Common and Jacks being shot in unusual numbers. I believe this abundance was, in Norfolk at least, universal. On a local game-stall I saw the following numbers of Snipe :—

Dec. 11th.—47 Common Snipe, 17 Jack-Snipe.

Dec. 12th.—(Almost identical numbers.)

* My spare time and many nights are now spent on Breydon, to and from, and in my houseboat.

Dec. 13th.—120 Common Snipe, 20 Jack-Snipe, 8 Woodcocks.

Dec. 14th.—Total Snipe on this date, 43.

Dec. 15th.—Did not obtain numbers on this date.

Dec. 16th.—Total Snipe, 310.

Thus, allowing an average of fifty Snipe on each of the dates missing, the week's record was something like 650 birds.

After the 16th numbers fell off almost to *nil*. Many other birds accompanied this inrush; Breydon and the Broads became alive with them. Hundreds of Dunlins and many scores of various Ducks were shot, only a portion of those killed locally being exposed for sale at this game-dealer's stall. Mr. Durrant, the proprietor, kindly furnished me with a complete list of birds brought up on the 16th, which is appended :—

Wildfowl on Game-stall, Dec. 16th, 1899.

336	Dunlins.	1	Gosander.
20	Coots.	80	Blackbirds.
6	Dabchicks.	1	Curlew.
12	Water-Rails.	32	Duck and Mallard.
3	Golden Plovers.	90	Half-fowl (being about equally divided between Tufted Ducks, Wigeon, and Pochards).
1	Heron.	3	Teal.
30	Larks.	3	Golden-eyes.
310	Snipe.		
10	Moor-hens.		
26	Lapwings.		

Besides these there were hundreds of Blackbirds and Thrushes, and many wildfowl scattered all over the Saturday's market.

From a wildfowler's point of view the above one day's figures compare favourably with a week's list given in Stevenson's 'Birds of Norfolk' (vol. iii. p. 175), which it will be interesting to subjoin :—

Wildfowl, Waders, &c., received from Dec. 14th to 21st, 1878.

447	Full Snipe.	2	Curlews.
21	Jack-Snipe,	4	Herons.
206	Green and Golden Plover	3	Kingfishers.
3	Grey Plover.	35	Teal.
14	Woodcocks.	147	Golden-eyes and other fowl.
41	Waterhens.	421	Duck and Mallard (220 from decoy).
2	Rails.	1	Great Plover.
17	Water-Rails.	1	Eared Grebe.
43	Coots.	2	Rough-legged Buzzards.
133	Stints.	2	Smew (male and female).
13	Owls.	29	Sundries.
4	Hawks (various).		Total, 1600.
9	Grebes.		

Another week's fowl is also enumerated with a total of 1107

birds, a note of explanation stating that the "Golden-eyes" (which is a common Norfolk gunner's name for them) were mostly Tufted Ducks. Of a total of twenty-two Grebes for the fortnight three were Dabchicks, one "Eared" (probably Slavonian), the remaining eighteen being Crested Grebes.

There is at the present time at Yarmouth but one dealer in wildfowl, Mr. Durrant, whose stall is in the market-place; and many thousands of birds, rare and common, have passed through his hands. His birds are received from the immediate locality, and from the country districts around, the smaller common species hanging in bunches, the larger ones singly from hooks. Rarer examples are promoted to a more conspicuous position upon a fruit-tray. This stall is a fairly accurate gauge as to what species are at any given time abundant, or are arriving. Durrant himself is full of anecdote. On one occasion he assured me that during some sharp weather he had brought to him in one day over 1100 Common or "full" Snipe, for which he paid during the greater part of the day sixpence apiece. Of these he forwarded two five-hundred lots to London dealers, receiving in the course of a day or two in return a remittance to the value of one penny each, accompanied by a polite note to the effect that "small cargoes were coming over from Holland" with other wild-fowl. In the severe winter of 1890-91 Durrant had a large supply of birds. I was fortunate enough to peep into his market-book on Nov. 29th, 1890, on which date were recorded the following as received:—

Nov. 29th, 1890.

1 Bittern.	110 Common Snipe.
240 Dunlins.	2 Bewick's Swans.
9 Knots.	1 Pintail.
11 Woodcocks.	3 Curlews.
47 Duck and Mallard.	14 Jack-Snipe.
52 Blackbirds and Thrushes.	Golden-eyes (several).
1 Godwit.	39 Larks.
14 Plovers (various).	

As this was an exceptionally busy year with him, I kept a record, usually counting the birds myself, publishing the same in the 'Eastern Daily Press.' The following two examples will suffice:—

Dec. 6th, 1890.

Tufted Ducks (several).	5 Golden-eyes.
Duck and Mallard (several).	Pochard and Wigeon (several).
1 White-fronted Goose.	Moor-hens and Coots (several).
Snipe (several).	1 Red-throated Diver.
1 Goosander.	2 Curlews.
Snipe (number).	12 Water-Rails.
3 Bewick's Swans. (making 5 for week).	3 Dabchicks.
3 Barn Owls.	2 Short-eared Owls.
Small birds (many).	1 Kestrel.

Dec. 20th, 1890.

1 Bewick's Swan.	1 Red-throated Diver.
23 Scaups.	1 Redshank.
9 Wigeon.	16 Pochards.
2 Goosanders.	1 Shoveler.
17 Woodcocks.	2 Teal.
2 White-fronted Geese.	36 Knots.
20 Tufted Ducks.	Many small birds.
1 Shelduck.	

It goes without saying that rare species soon change hands, the bulk of the commoner kinds going in hampers at night to Leadenhall Market.

Up to within recent years local gunners, except in the case of isolated intelligent sportsmen-naturalists, were so eager to shoot birds *en gros*, and were so ready to turn their victims into pence, that many rarities without doubt escaped notice, and were consigned to the *cuisine*. Many a scarce Sandpiper has been strung together with a parcel of Dunlins, and so spoiled for a specimen. On Sept. 8th, 1881, a gunner killed six Little Stints (*Tringa minuta*), and, taking them home, cooked them, ascertaining their identity almost immediately afterwards. It is on record that Lilly Wigg, an old-time Yarmouth naturalist, cooked and ate a Red-breasted Goose (*Bernicla ruficollis*), and did not even guess as to its species until the feathers afterwards attracted his attention.

During the first invasion of Pallas's Sand Grouse, a local gunner shot an example on the North Denes, taking it to a dealer named Watson (who in his day received many a *rara avis*), who gave him half-a-crown for it; one long tail-feather had been shot away. Watson offered him another half-crown if he would find the missing one, which he did. Another rural sportsman emptied a bag of common birds on a dealer's stall some years ago, "throwing in" a specimen he did not know, and so did not value it. It proved to be a Buff-backed Heron.

But to-day all the gunners are on the alert, as are the bird-catchers,* who, on securing a bird that in any degree differs from any they have before possessed, are careful to have an identification before disposing of it. In this way some rare Finches and other small birds have been detected, as the Serin Finch, Tawny Pipit, Scarlet Bullfinch, and others. The Warblers and other small Passeres were for long deemed scarcely significant enough for the attention of local observers. Unfortunately for themselves, their small size, agility of movement, and similarity of characteristics make their identification on the wing almost a matter of impossibility. Hence the growing inclination to shoot every unusually attired little stranger.

Of late years bird-value has been greatly enhanced by the eagerness for collecting specimens. Prices paid for local rarities have at times been very high. At the sale of the late Mr. Rising's collection of authenticated birds at Horsey, the following prices were realized :—

White-winged Black Tern	12	guineas.
Brown Snipe	13	"
Red-breasted Pochard	21½	"
Buffel-headed Duck	25	"
Spoonbills, ♂ and ♀	10	"
Hoopoes, ♂ and ♀	3	"

Before closing this introductory chapter, it remains to enumerate the names of several local men who have been conspicuous as ornithologists, sportsmen, and collectors.

In the earlier part of the century lived Charles Stuart Girdlestone, "whose union," say the Messrs. Paget, "of first-rate sporting accomplishments with the greatest ardour in the pursuit, gave him advantages which none here have since equalled." His birds passed into the hands of Mrs. Charles Baker, and have since been scattered. A Jack-Snipe was believed to be the only existing specimen, but Mr. B. Dye has a Stilt Plover, undoubtedly the same referred to by the Pagets as having been shot on the North River, which he purchased at the sale of the late Town Clerk, T. M. Baker's, effects. A Fork-tailed Petrel from the same collection is in the Yarmouth Tolhouse Museum. Lilly Wigg, who immortalized the Red-breasted Goose by eating it,

* The only net used by the few local birdcatchers is the clap-net.

is stated by the Pagets to have bought a Harlequin Duck* in the market, but recent naturalists do not think the occurrence sufficiently well established to entitle the species to a place in the list of Norfolk birds; and the same applies to the King-Eider† said to have been obtained by the same person. This species has been, however, identified from another part of the coast.

Mr. John Youell was "a great bird man"; his collection contained some choice specimens. He is mentioned by the Messrs. Pagets as having afforded considerable assistance in the compilation of their lists.

The Rev. C. Steward, Rector of Caister, whose name will remain associated with the first and for many years the only British-killed example of Steller's Duck (*Somateria stelleri*), presented to the Norwich Museum his collection of over a hundred specimens, including this Duck, a Purple Heron, and a Caspian Tern.

Mr. C. A. Preston obtained one of the earliest recorded Ferruginous Ducks (*Fuligula nyroca*), which was shot close by Giber's mill on the South Breydon wall, and which he submitted, when identified, to Paget, after whom the hybrid between this species and the Pochard has been designated—the Pagets' Pochard.

A Yarmouth grocer named Lucia‡ is mentioned as having been a familiar figure on Yarmouth beach, "where, gun in hand, he used to be a terror to the Gulls," of which he appears to have had a fine representative collection of species in their various stages of plumage.

John Smith,§ Librarian at Yarmouth, also collected and kept records, but "has left but faint traces of his favourite pursuit."

Stephen Miller's collection contained many choice birds, which were sold in 1853. There were seventy-four lots, and amongst them were the Buffel-headed and Red-crested Ducks.|| They produced what we should now consider very low prices—

* *Vide* Stevenson's 'Birds of Norfolk,' footnote in vol. iii. p. 219.

† *Ibid.* pp. 192, 384.

‡ *Vide* Trans. Norf. and Nor. Nat. Soc. vol. vi. p. 82.

§ *Ibid.* p. 81.

|| Catalogue of Birds in the Collection of Mr. Connop.

the rage for collecting had not then set in ; but some of these birds, sold thirty years after at Mr. Rising's sale, produced the very high prices already mentioned.

Amongst other names associated with those "halcyon days" may be mentioned Frederick Frere, Henry Teasdel, John Dawson Turner, Joseph Tomlinson, J. G. Overend, and Robert Rising of Horsey. Mr. Overend's very representative collection was dispersed in June, 1876. There were ninety-six uncased lots, numbering one hundred and eighty specimens, which fetched ridiculously low prices. Mr. Rising's birds were sold at Horsey, September, 1885. There were one hundred and forty-two lots of well-authenticated birds, which realized about £340, several of the best of them ultimately going to the Norwich Museum and to the Connop collection.

Among local collections at the present time stands prominently that of Mr. E. M. Connop, of Rollesby Hall, which at the time of cataloguing by Mr. T. Southwell a few months since consisted of 434 cases, containing 336 species of birds; and among them may be mentioned Overend's White Stork, Great Spotted Cuckoo, Black Stork, Greater Shearwater, Yellow-legged Gull, Little Bustard, and many others.

Mr. Fielding Harmer has choice birds, comprising a fine series of Breydon-killed Spoonbills, and several of the rarer Waders in nuptial attire, all obtained by him prior to the advent of the Bird Protection Acts. Mr. Bellin, Sen., has a locally killed Gull-billed Tern, Caspian Tern, and other rare Terns. Mr. B. Dye, a blind baker ornithologist, still collects, and is the proud possessor of a fine female Spoonbill with a grand crest, the Pectoral Sandpiper, White-winged Tern, Fork-tailed Petrel, and a number of others; several of them were preserved by himself before his eyesight failed him. Nothing more delights him now than being left to identify any bird placed in his hands by feeling it. Mr. E. C. Saunders, who collects as well as preserves his own specimens, has had, among others killed in this neighbourhood, Norfolk Plovers, Black-throated Diver, Montagu's Harrier, Solitary Snipes, and others. Mr. G. Smith's name is associated with the first recorded examples of the Tawny Pipit, the White Wagtail, the Mediterranean Black-headed and Iceland Gulls and the Greater Shearwater, mention of which, with other rare

occurrences, have been made at various times in the 'The Zoologist.' Mr. G. F. D. Preston has a grand Red-necked Phalarope in full summer plumage, and was the first to call attention to the increasing numbers of the Shore Lark visiting this locality, himself shooting several in 1876. He is the last of a family of local ornithologists of that name. The late Mr. E. T. Booth shot many of the choicest of his specimens, contained in the celebrated Brighton Museum, on Breydon, and on the sea off Yarmouth. Mr. W. Lowne, of Fuller's Hill, Yarmouth, taxidermist, should also be mentioned, as many of the rare birds noted in the subjoined list have passed through his hands, as have many in the county collections, noteworthy amongst them being Sabine's Gull (1881), White-tailed Eagle (1882), Manx Shearwater (1883), Roller (1883), Pallas's Sand Grouse (1888), Little Bustard (1889), Iceland Gull (1899), &c. Mr. H. C. Clark, of George Street, is the only other professional local birdstuffer.

The writer of these notes neither shoots nor collects, but has used eyes and field-glasses, and kept records of rare and interesting occurrences in local natural history for more than twenty years; and has helped in a small degree to found the Tolhouse Museum, which contains a number of cases of interesting birds.

The principal works relating to Yarmouth birds are as follow:

'An Account of the Birds found in Norfolk.' By Sir Thomas Browne, but not published till after his death in 1682. [Wilkin's Edition of his Works, vol. iv. pp. 313-324 (1835).]

"A Catalogue of Norfolk and Suffolk Birds, with Remarks." By the Rev. R. Sheppard and the Rev. W. Whitear. ['Transactions' of the Linnean Society, vol. xv. pp. 1-62, 1826.]

'Sketch of the Natural History of Yarmouth.' By C. J. and James (the late Sir James) Paget. [1834.]

'Observations on the Fauna of Norfolk.' By the Rev. R. Lubbock. [1845.] (A new edition, with additions from unpublished manuscripts of the author, and notes by T. Southwell, was published in 1879.)

"An Account of the Birds found in Norfolk," &c. By Messrs. J. H. Gurney and W. R. Fisher. [Published in 'The Zoologist' (1846, pp. 1300, 1373).]

'The Birds of Norfolk. With Remarks on their Habits, Migration, and Local Distribution.' 3 vols. By Henry Stevenson, F.L.S. [Vol. i. ii. published 1866 and 1870 ; vol. iii. being continued and completed by Mr. T. Southwell in 1890.]

"A List of all the Birds shot on Breydon Water up to 1890." By Mr. F. Harmer in P. H. Emerson's 'Wild Life on a Tidal Water.'

'Catalogue of the Birds of Suffolk,' &c. By the Rev. Churchill Babington. [Published 1884-86 ; contains much valuable matter relating to Yarmouth and Lowestoft.]

'Transactions' of the Norfolk and Norwich Naturalists' Society, published yearly [1869-1899], contain many local references.

The pages of 'The Zoologist,' founded and first edited by Edward Newman in 1843, are a perfect epitome of Norfolk zoology, having been the recognized medium for such records since its commencement to the present time. Annual "Ornithological Notes" in this Journal by Mr. J. H. Gurney include many local items forwarded to him by local observers during the last twenty years.

In conclusion, my best thanks are tendered to Messrs. J. H. Gurney and T. Southwell for assistance kindly rendered ; and to Messrs. Durrant, Dye, Lowne, Preston, and Saunders for several dates of interesting occurrences with which they have supplied me.

(To be continued.)

AN OBSERVATIONAL DIARY OF THE HABITS OF
THE GREAT PLOVER (*ŒDICNEMUS CREPI-*
TANS) DURING SEPTEMBER AND OCTOBER.

By EDMUND SELOUS.

THE Great or Norfolk Plover being not yet exterminated in East Anglia, I spent some time during last September and October in observing its habits.

A thick belt of bracken fringes on one side a barren area of sand scantily clothed with lichen or moss, or with some very close dry herbage, which (if not the lichen itself) is browsed on by Rabbits. In other parts it is bounded by a tangle of very long thin wiry grass, or by some stunted and sorry-looking heather, clinging amidst sand and flints. Beyond, on one side, is the river; on the other a piece of open moorland, which the bracken also fringes on one side, whilst the road skirts it on another. I had seen the Plover on this sandy waste (which I here call the amphitheatre or plateau), and thought the bracken might give me the means of getting closer to them than I had before been able to do.

The following notes were made almost always on the spot, sometimes whilst the actions noted were proceeding, usually just after. They were copied out, and sometimes a little elaborated or added to on my return home the same evening. If occasionally I put down something after a longer interval of time, I had always kept it quite fresh in my memory.

September 1st, 1899.—Crept up through the bracken to edge of open space between 5 and 6 p.m., and found myself close to a number of the Great Plover. They, however, shortly took alarm from the moving of the fronds, and flew farther off, but to no great distance for the glasses. Some three or four birds remained quite near. The birds that had flown off were joined by others, and at last by a flock of ten. They may then have amounted to some fifty in all, and stood stretched out in a long

straggling line, ganglion-like in form, swelling out into knots where the birds were grouped more thickly, with thinner spaces between. Watched them mostly through the glasses. Characteristic actions were preening feathers of the breast and wings. The latter they stretch out, and then, twisting the neck to one or the other side, passed the primary quill-feathers, as it seemed to me, through the beak. Another—one of the birds near me—laid one side of the head on the ground so that I could see the eye of the other side staring up. This I observed for the first time. The reason I do not know. Thought at time it was to rub the head, but, as I have often seen them scratch their heads with one foot most neatly and effectively—as indeed do all birds—this would seem superfluous, and moreover it kept the head still.

Whilst watching the main body of birds I observed one make several sudden little impetuous runs in different directions, beating and striking about with its wings. There was excitement, but the actions seemed to have no reference to the other birds (as of display), who seemed quite indifferent. The line was long and in general very straggling, and this particular bird was not in any close proximity to others, but rather segregated.

One of the birds that had remained after the others flew off now came very near, so that—still using the glasses—I observed, as he made one of the little quick characteristic runs forward (suggestive of a Thrush on the lawn), the object which occasioned it—a delicate white thing in the air, which I took to be a small thistle-down. This he secured and ate, and I imagined that his peckings at it after it was in his possession were to disengage the seed from the down. Almost immediately afterwards, however, a small brown moth came into the field of view, flying low over the belt of dry bushy grass where the bird was. Instantly the bird (who seemed to catch sight of the moth about the same time as I did) started in pursuit, with the same rapid run and head stretched out. He got up to the moth and essayed to catch it, pecking at it in a very peculiar way, not excitedly or wildly, but with little precise pecks, the head closely and guardedly following the moth's motions, the whole strongly suggestive of professional skill. The moth eluded him, however, and the bird stopped rigidly, having apparently lost sight of it. Shortly afterwards, when the moth had gone some way, he caught sight of it again,

and made another quick run in pursuit, coming up again, and again making his quick little pecks, but unsuccessfully as before. There was then the same pause followed by the same run, then a close near chase, and finally the moth was caught and eaten. What I had taken for a small thistle-down had been probably therefore (though the other is possible) a small white moth. It was quite a distance from where the bird first sighted the moth to where he finally caught it. In another chase, the object of which I was unable to see (twilight coming on), the same bird, at the end of a run, made a straight-up jump into the air (missing it, I think). This latter action I have not observed before, but the quick eager runs with sudden start-stops between—the head thrust eagerly forward—were so exactly the habitual actions of these birds (as I have often watched them at a greater or less distance through the glasses) that I now feel sure they are usually pursuing low-flying moths or other insects at such times. I had before often connected these actions with something on the ground—imagining a fresh object for each run—and had wondered both at the eyesight of the bird and its apparent want of interest when it got to the spot. Aerial game had not occurred to me.

Later, another of the few birds near me kept running about at short intervals in an excited manner, waving or rather flinging its wings about in a tumultuous manner.

Another one, quite close (but now getting dark), seemed much occupied in probing or picking up something from the ground; but all at once it also made a run forward, throwing about its wings, and did so several times afterwards in a way which suggested a relation between this and its search for food on the ground, or whatever else the actions suggesting such search may have really been. (Query. Did it attempt to beat down a low-flying moth with its wings? But the one that caught two moths—and this was very likely the same bird—made no such attempt, nor did the action suggest that at all forcibly.) In the two other birds this excited running about and beating of the wings suggested anything rather than a part of any process of food-getting. I incline to think that the ground probing or pecking action has some other meaning. Their sad wailing cry uttered all about by the birds whilst on the ground, as also whilst flying.

September 4th.—Got to same place about 6 p.m., and counted fifty-one birds standing or sitting about within the limits of the sandy amphitheatre in a scattered proximity. Watching through the glasses, I saw one bird advance quickly towards another (comparatively, as I thought), and, when just in front of it, wave and flourish with its wings. Then, however, the same bird, turning, moved a step or two away from the one it had seemed to challenge,* and crouched on the ground in a manner not at all suggestive of combative inclinations.† Shortly afterwards either this same or another bird (but I think the same one) ran pugnaciously at another, and both then stood with outstretched wings and heads craned forwards (the tips of the beaks seeming almost to touch each other), apparently on the point of engaging in combat. They did not do so, however, but in a moment or so paced away from each other, and stood indifferent.

As it grew towards twilight I again noticed the sudden little rushings of the birds, accompanied with wavings of the wings, and this became much more frequent as the twilight deepened. At length, by fits and starts—now one and now another, so that there were generally several at a time in different parts of the amphitheatre—the whole troop of birds were thus occupied, and it became an interesting spectacle. I watched as long as I could through the glasses, and, when no longer able to use them, very luckily two birds came quite near me, so that, although now semi-dark, I could see them well with the naked eye. Watching the whole time as closely as possible, I endeavoured to make out the meaning of this wing-waving, and it appeared to me that it was in connection with the chase of flying insects, sometimes (as I observed and feel sure about) in aid of a jump into the air after one, at other times owing, as it seemed, to excitement merely—the excitement (and I think the *social excitement*) of the chase. But that it occurred in and as a part of the pursuit of game (insects) I could not doubt after what I had seen three nights ago. I noted that when one bird ran and waved his wings another

* The actions of the challenged bird I did not note at the time, and cannot recall, though I think they were similar. Do what one will, a certain amount will be seen and forgotten, or but dimly recalled.

† The bird appeared to me to elevate the tail and posterior part of the body generally.

would often run quickly up to him, also waving them, and join in the pursuit. Had I not seen the chase of the moths alluded to I should have thought this action either bellicose or a joining or rivalry in display, though I am sure I should not have felt satisfied with either theory. Now I can have no doubt that it was simply the desire of one bird to get what another was chasing—as with fowls, ducks, &c.

To sum up what occurs to me from this and the previous day's observation.

1st. The extension, waving, beating about, &c., of the wings—whilst not in flight—is an accustomed action of these birds, indulged in on various occasions, and ready to leap out under excitement, irrespective of any more *particular* reason.

2nd. It is employed (with some other set forms) as a challenge to combat, and (probably) acceptance of such challenge.

3rd. The birds spread and wave their wings whilst chasing insects.

(a) Through excitement merely.

(b) *Possibly* to beat down a moth, &c., on to the ground (doubtful).

(c) *Possibly* again to catch the wind, and assist them in their swift runs when it is with them (also doubtful).

4th. They help themselves with the wings in jumping up at flying insects which they are pursuing. (Seen distinctly.)

5th. I think, but cannot be sure (and assurance is much needed), that I saw *once* (Sept. 4th) a bird pursue a flying insect for a short distance *on the wing*, and near the ground. There was no doubt as to the chase on foot, and the flight came, or seemed to come, as part of such chase.

Not only were the actions of the birds whilst running (as described) exactly like those of the one I had seen catch the moths on Sept. 1st, but it would have been difficult to reconcile them with any other hypothesis than that of the pursuit of some aerial but low-flying prey. They frequently ran the game down, pecking it down as it were, and securing it either on or just above the ground, though to-day I never once actually saw the pursued insect.

The activity becoming so general and so greatly increased at twilight is in accordance with moths beginning to fly then.

A social feeling seemed to me to be manifested in this hunting scene—a sort of “Have *you* got one? *I* have. That bird over there’s caught two!” idea. But this may be quite imaginary. Isolated birds (*comparatively* alone) ran about in the same way. Still, the whole scene with its various little incidents gave me that idea. Gradually, as it became dark, the birds all flew away, two or three or more together. It often seemed as if a chase ended in a flight away, but this may not have been really the case. It *may* have now become too dark for the birds to see and chase (perhaps minute) insects, or to see them at all, though they seem fairly nocturnal, and their visual powers are no doubt in proportion to the very large eyes.

One bird to-day was sitting right in a Rabbit-burrow. Though looking down at it from where I was, I could only see its head, shoulders, and upper part of the breast. The whole amphitheatre is more or less a Rabbit-warren, and Rabbits and birds were often extremely close together. Usually they seemed unaware of each other’s existence, but when a Rabbit—either pursued by or pursuing another—ran with great speed, and seemed coming right down on a bird, the latter would manifest anxiety, and run a little to get out of its way.

September 5th.—Arrived about 5.30. Fair number of birds about, but not nearly so many as yesterday. Almost from time of my arrival they were all in more or less constant motion, their actions being exactly the same as before, excepting that the waving of the wings and little jumps into the air (as described) were, though not entirely absent, yet comparatively so. Just in front of me the air was peopled with a number of minute insects—gnats, flies, or small Hymenoptera—many hovering just above the ground, upon which (on blades of grass, &c.) they often settled. I make no doubt these, together with small moths, were the game pursued.

A large flock of Starlings came down upon the plateau, spreading themselves over the greater part of it, and they behaved just as the Plovers—running excitedly about in the same manner, and evidently with the same object. What interested me especially was that they frequently rose into the air, pursuing and, as I feel sure, often catching the game there (sometimes more than one in the same rise, I believe), turning and twisting about like

Flycatchers, though with less graceful movements. Often, too, whilst flying—fairly high—from one part of the plateau to another, they would deflect their course in order to catch an insect or two *en passant*. I observed this latter action first, and doubted the motive, though it was strongly suggested. After seeing the quite unmistakable Flycatcher actions, I felt more assured as to the other.

The very great diminution in the waving of the wings to-day as compared to yesterday, whilst engaged in the same pursuit, I do not know how to account for. It may perhaps suggest that this is more due to excitement connected with each other's presence (social) than to any other cause. If so, the birds were not so socially excited to-day as yesterday, and this may possibly be due to the fact that their numbers were not nearly so great—hardly, I should think, amounting to half. Though I was not able to make out with the glasses any insect actually the object of pursuit, I did see two small moths flying low over the grass—just as required to explain the birds' actions. I believe, however, that the staple of their food was minute flies or gnats.

As it grew towards twilight—after the Starlings had gone—large quantities of Swallows and Martins took possession of the air round about. Whether they had come wholly or chiefly or partly for the insects I do not know.

I frightened several birds this time, and as the twilight closed in not many were left. Lying just within the edge of the bracken birds in ones or twos would often walk past me within twelve paces (as I judged), presenting of course a splendid view. A sudden bob forward of the head in a very swingy manner, the tail at the same time swinging up (very suggestive of a wooden bird that performs the same actions upon one's pulling a string) is a characteristic action, and seems to have no special reference to anything—unless deportment.

Left about 7.15.

September 8th.—Arrived somewhere between 5.30 and 6 p.m. Though as cautious as I could be, and keeping well behind the bracken (always lying flat), yet several birds took alarm and flew off, though not to any great distance. Including these I counted forty-one standing scattered about the amphitheatre. They were all of them particularly dull and listless, hardly moving from

where they stood, and much less occupied in preening their feathers than has hitherto been the case. This inaction continued up to twilight, and I connect it in some measure at least with an unusual absence of insects at this time. For the first time I was bothered neither with flies nor (till nearly dark) mosquitoes, nor did I see any insect in the air or on the ground in front of me. Since the 5th it had rained heavily, and yesterday almost the whole day, whilst to-day has been bright and fine. This listlessness is in marked contrast with the great activity of the birds on the afternoon of the 5th, which was certainly displayed in catching insects, then much *en évidence*. Still the diminished preening of the feathers and almost moping demeanour is not accounted for in this way. The only piece of action I observed whilst it was still good daylight was when one bird pursued another in a hostile manner, a cry being uttered by one of them (I think the pursued one) as of distress or remonstrance. (This, at least I think, but the birds were at too great a distance for me to be *certain* that it was not another of the birds round about that called.) With twilight, however, activity began, and the running and waving of wings was now perhaps more marked than it has yet been (at least on the part of some of the birds). One bird executed what might certainly be described as a dance, making swift (and apparently aimless) rushes backwards and forwards, waving the wings all the while in an excited manner, making now and again (I *think*) a little leap into the air, and, as a part of all this, a short flight just over the ground. I am justified in saying "as a part," for the bird did not stop and fly, and, on alighting, recommence, but the flight arose out of the wild waving and running, and when it was over these were at once resumed. Another bird made three little runs—advancing, retiring, and again returning—all the time with wings upraised and waving, then made a short flight close above the ground (describing segment of a circle), and, on alighting, continued as before. The birds, as a body, behaved similarly. I could not of course observe each one, but kept catching the light inner plumage of the wings as they were thrown suddenly up. All about now over the plateau the plaintive wailing notes were heard, and gradually—as on former occasions—the birds flitted off. I was again lucky in the first of the birds, whose dance movements I have more particularly

described, being near to me, whilst the second, though a good deal farther off, was still plain through the glasses, in spite of the increasing gloom. Soon after this I had to lay the glasses down, and then I only got "dreary gleams about the moorland" as the wings of now one and now another bird were flung up. The interest to-day lay in the fact that, as far as I could observe, this wing-waving "dance"—for so, I think, it may be called—did not take place during (much less was it incidental to or part of) a hunt for food. The birds (so it appears to me) danced it purely for its own sake, and not in connection with anything else, which I had not felt satisfied about before. With most, at any rate, I think this was the case—certainly with the two that I saw best, and have chiefly instanced. One bird only I distinctly saw running and pecking something (insects presumably) off the dry scrubby grass, but this was not waving its wings.

On the last day of observation (Sept. 5th) the birds were early occupied in chasing insects, but it was not till twilight that the wing-waving began to be at all prominent. It then alternated with the chase, and it is possible that the two, though quite distinct, may sometimes have been combined together into a dancing hunt, or hunting dance, as indeed it seemed to me at the time (though very likely I was wrong). On all four occasions it is the close of the day that has ushered in the dancing, so that it would seem that the birds relax themselves in this way before leaving their grounds, and flying off into the night. (They are active during the night, and their cry is often to be heard as they fly high in the air.) But these dance-wavings of the wings must be carefully distinguished from when a bird pursuing an insect jumps into the air after it, aiding itself with its wings—as might naturally be expected. It is also possible that they may sometimes beat down a moth with the wings, but I do not think this has been the explanation of anything I have yet seen.

September 9th.—Arrived at about 7 p.m., when it was already getting dusk. Several birds there, but not so many as the day before. They were dancing when I got there, and I noted now, without any doubt, that they often made little leaps into the air whilst waving the wings—not at all in the same way, however, as the bird that I saw jump into the air after an insect. There was no doubt whatever as to the motive of that, and I now

at once appreciated the difference. Nothing further noted. Left at 7.30.

September 10th.—Arrived some time between 5 and 6 p.m. Thought at first there were no birds there, but at last located them—a fair number—far off on the outer edge of the plateau. They remained there till shortly after the arrival of a Heron, who flew down near the middle of the space. They then began to come up, several approaching very close to the Heron—to look at him, it almost seemed—and I cannot help thinking, though nothing occurred to demonstrate, that they were not indifferent to his presence. The shades of evening were now falling, and the birds began to disport themselves as before. The light seemed more than usually bad for the glasses, so that I had soon to lay them down, and I obtained, perhaps without their aid, a better general impression. The birds ran about raising and waving their wings, often leaping into the air, and often making little flights, or rather flittings, over the ground as part of the disport, all as described before, uttering at intervals their sad wailing cry. It must not be supposed that all the birds acted thus at once. It was now one and now another, and the eye never caught more than a few gleams (three or four or five) of the flung-up wings at one time over the whole space. It was a gleam here and a gleam there in the deepening shadows. "Dreary gleams about the moorland" is indeed a line that exactly describes the effect. This disporting ended in, and was the recognized preliminary to, the bird's flying off. I counted seventeen (but many had flown before I began to count) as they flew one after another at short intervals over my head, uttering their wild note. Though of the same character, this note, as uttered on the ground, is not the same as when uttered flying. On the ground it is much more drawn out, and a sort of long wailing twitter* often precedes and leads up to the final wail. In the air it comes as just a wail without this preliminary.

These birds, then, stand or sit about during the afternoon (but from what hour I do not yet know) in their chosen place of assemblage, and if not occupied in catching insects or preening

* This no doubt is the "clamour" mentioned by Mr. Aplin in 'The Zoologist' for October, 1899 (p. 437). It is full of a wild sad beauty, and effective beyond words. I too have only heard it uttered on the ground.

themselves are dull and listless. But as the evening falls, and the air cools, they cast off their lassitude, think of the joys of the night, there is dance and song for a little, and then forth they fly. Sad and wailing as are their notes to our ears, they are no doubt anything but so to the birds themselves, and, as the accompaniment of what seems best described by the word "dance," may perhaps fairly be called "song." The chants of some savages whilst dancing might sound almost as sadly to us, pitched, as they would be, in a minor key, and with little that we would call an air. Again, if one goes by the birds' probable feelings—which may not be so dissimilar to the savages', or indeed to our own on similar occasions—"song" and "dance" seems a legitimate use of words.

September 13th.—Arrived 6 p.m. or little after. Very dark day. Sky livid and covered with clouds, and close sultry feeling as of approaching thunderstorm. It was with difficulty I could distinguish some few birds. As the gloom increased I caught a gleam or two, but nothing that I could see to note. Only some half-dozen or so birds flew over my head at the usual time. Whether the birds partook of the dullness of the day, or whether the small number checked the inclination to dance (as I suspect), there seemed to be very little of this.

September 14th.—Arrived at about 6 p.m., but have nothing special to note except that, there being some fifty or eighty birds in the amphitheatre, another large flock of them, numbering, as far as I could judge, from seventy-five to one hundred, flew over it. They did not, however, settle, and later I alarmed some of the standing ones, who flew farther away. Afterwards I counted thirty-five, but this may have included the later. This shows what numbers of the Great Plover there are in this part of England. Long may they continue, and (*that they may*) may nobody take the smallest interest in them!

September 15th.—(Weather dull, sky overclouded.) Arrived about 5.30 p.m. There were not many birds that I could make out, and none near. A drizzling rain soon began, and this increased gradually, but not beyond a smart drizzle. Shortly after the rain commenced the birds began to come down from where I had seen them, and (evidently) from other parts on the outer edge of the amphitheatre, and to spread all over it till

there were numbers of them, and dancing of a more pronounced, or at least of a more violent kind than I had yet seen, commenced. Otherwise it was quite the same, but the extra degree of excitement made it, of course, much more interesting. It was, in fact, remarkable and extraordinary. Running forward with wings extended and slightly raised, a bird would suddenly fling them high up, and then, as it were, "pitch" about over the ground, waving and tossing them, stopping short, turning, pitching forward again, leaping into the air, descending and continuing, till with another leap it would make a short eccentric flight low over the ground, and pitch suddenly down in a sharp curve. I talk of their "pitching" about because their movements seemed at times hardly under control, and each violent run or plunge ending, in fact, with a sudden pitch forward of the body, the wings straggling about (often pointed forward over the head) in an uncouth dislocated sort of way, the effect was as if the birds were being blown about over the ground in a violent wind.* They seemed, in fact, to be crazy, and their sudden and abrupt return, after a few mad moments, to propriety and decorum had a curious and "bizarre" effect. Though having just seen them behave so, one seemed almost to doubt that they had. One bird in particular that had come to within a moderate distance of me made itself conspicuous in the way I have tried to describe. It was one of some half a dozen gathered together under a solitary crab-apple tree almost directly opposite me, and both with the naked eye and the glasses I observed them all thoroughly well. One would often run at or pursue another with these antics. I saw one that was standing quietly caught, and, as it were, covered up in a little storm of wings before it could run away and begin waving its own. These little chases were evidently in sport, not anger. Very different was the action and demeanour of the two birds I saw about to fight. This and the general behaviour of the group made it evident that they were stimulated in their dance-antics by each other's presence. This is by far the finest display of the sort that I have yet seen, and must certainly be due to the rain, which the birds obviously enjoyed. They had been quite dull and listless before, but as

* There was little or no wind after the rain commenced, nor has this explanation been tenable as yet even in the smallest degree.

soon as it fell they spread themselves all over the plateau, and the dancing began. As far as I could observe, the birds now were very little occupied in procuring food. There was a peck or so at something now and again, but this was casual, and, as it were, an interlude. The constant quick running and stopping whilst the wings were folded appeared to me to be only a part (the less excited part) of the general emotion, out of which the sudden frenzies arose. There was also the usual vocal accompaniment. As soon as they had spread themselves out over the amphitheatre the wailing note went up, and was caught and repeated from one part of it to another at greater or less intervals. The whole ended in flight as before.

I remark a great difference in the shade of these birds, plumage. The breast and ventral surface is indeed light in all, but, whilst the back is in some so dark as to look, towards evening, almost black through the glasses, in others it is so much lighter that it looks almost white by contrast, or even of itself.

September 17th.—About 1 p.m. walked towards the amphitheatre without concealing myself, wishing merely to ascertain if birds were there at that hour. When I was still a good way off a very large number rose into the air, and I then edged off so as not to alarm them further, and to let them resettle, which after a time they did, and I retired.

At 11 p.m., it being bright moonlight, I again went to the place, and walked around and over the entire amphitheatre, noticing and picking up several feathers in the moonlight. I did not put up a single bird, nor could I hear their cry anywhere around. The place was quite deserted. Returning, I had the pleasure of liberating a poor Rabbit caught in one of those vile toothed traps, the selling or possession of which should be made a criminal offence, with punishment to "fit the crime," à la Mikado.

(To be continued.)

NOTES AND QUERIES.

MAMMALIA.

INSECTIVORA.

Varieties of Mole.—The variety of *Talpa europaea* mentioned by Mr. Forrest (*ante*, p. 142) is not at all uncommon in some parts of the country. In their various stages they are known to the Mole-catchers as "blue" Moles. I have several in my possession. The most difficult variety of Mole to get hold of is one spotted with white—at least that is my experience. I have a good series of skins, but have never been able so far to obtain a spotted example.

With regard to WATER SHREWS being found far from water, I have several times noticed this, and have picked them up dead when shooting on dry sandy land, where the nearest pond or stream was some mile or so away.—OXLEY GRABHAM (Heworth, York).

Lesser Shrew in Shropshire.—The Rev. W. Lightfoot Harrison, of Great Woolaston, sent me, on March 15th, a little animal which he had found in his garden the previous day. On examination it proved to be a specimen of the Lesser Shrew (*Sorex pygmæus*), a species which has never before been recorded in Shropshire. It will be placed in the Shrewsbury Museum.—H. E. FORREST (Bayston Hill, near Shrewsbury).

UNGULATA.

Equus quagga, L.—I have for some time been collecting information regarding the Quagga of South Africa, which, it is feared, is now wholly extinct, though other members of the family still survive in sadly diminished numbers. I should be glad for any information on the following points: Former range of the Quagga; range of variation in colour, if any; breeding season; Quaggas born in captivity; Quagga hybrids with Horse or other animal; date when a living Quagga was last seen in its old haunts; any aged animal still living in captivity. I have already details of external characters, male and female, and foetal young; food; museum specimens; Lord Morton's Quagga hybrid, and so on. I should specially like to hear of any specimens preserved in museums; my list already comprises London, Edinburgh, York, Manchester, Paris, Leyden, Amsterdam, Berlin, Berne,

and Cape Town. It should be remembered that the true Quagga is meant, and not the comparatively common Bonte-Quagga, or Burchell's Zebra. All assistance would be gratefully acknowledged should enough information be gathered to publish in book form.—GRAHAM RENSHAW (Sale Bridge House, Sale, Manchester).

A V E S.

Blackcap in March.—On March 12th I heard a Blackcap (*Sylvia atricapilla*) singing among the thorn-trees on Clifton Down, and had a good view of the bird more than once. It is natural to suppose that it has spent the winter in England.—HERBERT C. PLAYNE (Clifton College).

Wild Swans in North Ireland.—It may interest some of the readers of 'The Zoologist' to learn that there was an unusually large migration of Wild Swans to Loughs Swilly and Foyle this winter. Mr. D. C. Campbell, of Templemore Park, Londonderry, writes me "that one hundred and fifty have been seen in one flock on Lough Foyle, and quite a number have been frequenting the river some miles above Derry." Besides those noticed by me near Bartragh in 'The Zoologist' (*ante*, p. 39), several other flocks have been seen and heard passing to the various lakes during this winter.—ROBERT WARREN (Moyview, Ballina).

Unusual Numbers of Green Plover in Worcestershire.—During the winter large flocks of Green Plover (*Vanellus vulgaris*) in this county have been an unusual occurrence. They began to arrive in October, and during November, December, and January the flocks were enormous. They seemed to be plentiful over the whole of the northern half of the county, every suitable field having a certain number on it, the water meadows especially being very much frequented by them. Golden Plover also, which I consider rare in this part of the county, were, during November and December, quite common. For years the numbers of Green Plover in this district seemed to be decreasing for no apparent reason; I was therefore much pleased to see them return in such numbers. I might also mention that Bramblings and Redwings arrived in greater numbers than they have done for ten years, and remained all through the winter, feeding with other Finches on stubbles, except for the first fortnight after their arrival, when, as usual, they fed on the beech-mast.—H. E. HOWARD (Stone House, near Kidderminster).

Bleater Snipes (*Gallinago cœlestis*) near Aberdeen.—My attention was directed on the 5th of last July to a male of this species, which was producing the peculiar noise which gives these birds their name. I again saw a pair of these Snipe on July 16th, which led me to suppose that they were breeding in the locality. Although they were so often seen through the season as to show that they were resident, neither nest nor young were seen to prove that they had nested. The occurrence of these two birds remaining

here during the nesting season is worthy of notice, as not having happened, to my knowledge, for many years, although I have sometimes seen a solitary specimen at different times in various summers during that period. The birds are not rare here in winter, an occasional one being frequently seen. It is the appearance of the pair during the nesting season which surprised me. I recollect when several pairs nested near here, but they decreased to only a pair or so nesting in an occasional season. Then they became so reduced that no nesting was known. It would be interesting to know whether there have been any other extensions in the summer range of these birds during the past season. I have a special reason in being interested in the question, because for several years their favourite haunts were practically overrun by Rabbits, which are well known as being very much disliked by various other animals. Means were taken during the previous winter to decrease the number of these rodents on the spots the Snipe frequented during the past summer, and the idea crossed my mind that the Snipe had found their way to the marshy moorland after the Rabbits had been decimated there, and that the presence of the latter had kept the former away on some previous years at least.—W. WILSON (Alford, Aberdeen, N.B.).

Birds Singing during a Thunderstorm.—For some reason or other I have missed reading my 'Zoologist' for July, 1898, until now, and so have only just seen an interesting little note by Mr. Horsbrugh on this subject at p. 322. Mr. Horsbrugh records the singing of many Thrushes and a few Chaffinches during a heavy thunderstorm on May 23rd, 1898. I can add the Wood-Pigeon to his list; and in the 'Irish Naturalist' for October, 1899, at p. 231, will be found a short note in which I mentioned that the cooing of Wood-Pigeons was in no way interrupted by a heavy thunder-storm, accompanied by rain, on Aug. 18th, 1898. The voices of these birds were constantly audible between the thunder-claps. — G. E. H. BARRETT-HAMILTON (Kilmarnock, Arthurstown, Co. Wexford, Ireland).

PISCES.

Blue Shark in Killala Bay: a Correction.—In my notice in the January number of 'The Zoologist' of the occurrence of a Blue Shark on the island of Bartragh, I erroneously named it the Blue Shark from the description received from a person to whom Capt. Kirkwood related the occurrence. However, on meeting Capt. Kirkwood, and talking about the fish, it was evidently a fine specimen of the Fox Shark (*Alopecias vulpes*), 10½ ft. large, and the elongated portion of the tail-fin nearly as long as the body, fully 4 ft. in length; and he was so struck with this peculiarity of the tail that he cut it off and brought it home.—ROBERT WARREN (Moyview, Ballina).

[Second-hand identifications are always unreliable. We were under the impression that Mr. Warren had satisfied himself as to the identity of the species.—ED.]

PRESERVATION OF ZOOLOGICAL SPECIMENS.

Hard-sat Eggs: a Suggestion.—As the nesting season is now at hand, I should like to suggest a method of dealing with hard-sat eggs which I have not yet seen mentioned in 'The Zoologist.' Of course no one would think of taking hard-sat eggs when fresh ones could be obtained, but sometimes we come across valuable eggs which one does not like to leave, even if much incubated. Some collectors endeavour to extract the embryo with fine hooks, with or without previously dismembering it with fine scissors (embryotomy); others cut a door in the shell, which is replaced after removal of the chick; while others again insert chemicals into the shell through the drill-hole. As is well known, skeletons of small mammals or birds may readily be obtained by placing the body of the creature near an ant's nest, when the bones will speedily be picked clean by the swarming and industrious insects. In the same way they would probably devour the contents of a hard-sat egg, as the foetal tissues, being only partially developed, would be more easily disintegrated than those of an adult animal; and it would be well worth while, in the case of a hard-sat and valuable egg, to drill a hole in the shell large enough to admit an ant, and, after cautiously breaking up the contents a little with a pin, to place it on the ground close to an ant's nest, where it could be left for a few days, if suitably protected from dust and injury. A very delicate and thin-shelled egg might be injured by the powerful mandibles of ground-loving beetles, such as those of the *Carabus* and *Staphylinus* type, but this would be only a rare and occasional accident. The embryo, however putrid, being enclosed in a shell, would probably not tempt the efforts of the burying-beetles, such as *Necrophorus ruspator* or *N. vespillo*; and I trust that this method may be of service in saving valuable eggs during the coming season.—GRAHAM RENSHAW (Sale Bridge House, Sale, Manchester).

NOTICES OF NEW BOOKS.

A Monograph of Christmas Island (Indian Ocean). Physical Features and Geology by CHARLES W. ANDREWS, B.A., B.Sc., &c.; with descriptions of the Fauna and Flora by numerous contributors. Published by the Trustees of the British Museum.

THIS is the account of a piece of real biological work, well conceived and admirably carried out. It is truly zoological, inasmuch as palæontology has not been neglected; and by the inclusion of botany it becomes in a proper sense a full account of the natural history of the island. Christmas Island is situated in the eastern part of the Indian Ocean, in S. lat. $10^{\circ} 25'$, E. long. $105^{\circ} 42'$. Java, the nearest land, is about 190 miles to the north, while some 900 miles to the south-east is the coast of North-West Australia. Geologically, as Mr. Andrews describes it, "the island is, in fact, the flat summit of a submarine mountain more than 15,000 ft. high, the depth of the platform from which it rises being about 14,400 ft., and its height above the sea being upwards of 1000 ft." Sir John Murray defrayed the necessary expenses for the expedition, which was successfully carried out by Mr. Andrews, one of the staff of the British Museum.

Collections were made in all branches of natural history, and these, as a rule, have been worked out by specialists in their respective groups. Anthropology is alone discarded, but necessarily, for when visited by H.M.S. 'Egeria' in 1887, "the island was found to be entirely uninhabited, and there was no indication that it had ever been occupied."

Readers of this Journal will enjoy the bionomical notes of Mr. Andrews which are attached to the more technical references to many species. We can only notice a few. The Rat (*Mus macleari*) has for natural food mainly fruits and young shoots, and to obtain these it ascends trees to a great height. We read:—"I have often seen them run up the trailing stems of the lianas, and, in

fact, they can climb as well as a squirrel. In the settlement they utterly destroy all the fruit they can get at, and frequently come into conflict with the fruit-bats on the tops of the papaia-trees." The Frigate-bird (*Fregata aquila*) forms an article of food for the inhabitants, and is easily captured. A man climbs "into the topmost branches of a high tree near the coast, armed with a pole eight or ten feet long and a red handkerchief. The latter he waves about, at the same time yelling as loud as possible. The birds attracted by the noise and the red colour swoop round in large numbers, when they are knocked down with the long pole." Fresh information is also recorded concerning our old friend the Robber Crab (*Birgus latro*). "They have a curious habit of often dragging their food long distances before attempting to eat it. I have seen a Crab laboriously pulling a bird's wing up the first inland cliff, half-a-mile or more from the camp whence it had stolen it."

The geographical relations of the fauna and flora are mostly Indo-Malayan, and, although a large number of species are described as endemic, especially among the insects, this is probably owing to the entomological fauna of the neighbouring islands being still imperfectly known. The volume is well illustrated with twenty-two plates, a map, and numerous cuts in the text, and worthily upholds the character of British Museum publications.

The Atoll of Funafuti, Ellice Group: its Zoology, Botany, Ethnology, and General Structure. Based on collections made by Mr. CHARLES HEDLEY. Sydney: published by order of the Trustees of the Australian Museum.

PART I. of this excellent memoir appeared in 1896, and Part VIII., concluding it, was published last year. It altogether relates to the atoll of Funafuti, which was discovered by Capt. Peyster on March 18th, 1819. According to the observations of Capt. Wilkes, it lies in lat. $8^{\circ} 30' 45''$ south, long. $179^{\circ} 13' 30''$ east,— "a position which may otherwise be described as due north of Fiji, and precisely half way between that and the Equator."

Part I. is devoted to a general account of the atoll, its

structure, climate, vegetation, and population, the last topic being necessarily more or less ethnological, but its ethnology is treated also alone in Part IV., and these sections are all from the pen of Mr. Hedley. Some short notes on rock specimens are contributed by Dr. T. Cooksey. Aves are described by Mr. J. North, but as the ornithological collection consisted of only "six specimens, referable to four well-known Australian species," there was not much to write about. The interesting fact of the Frigate-bird (*Fregata aquila*) being domesticated by the natives and used as a carrier bird is, however, thoroughly dealt with. The Insecta and Arachnidæ have been studied by Mr. W. J. Rainbow, and the Crustacea and Echinodermata by Mr. T. Whitelegge, who has also dealt with the Alcyonaria, Sponges, Madreporaria, Hydrozoa, Scyphozoa, Actinozoa, and Vermes. Mammals, Reptiles, and Fishes have been detailed by Mr. Edgar R. Waite. "Excluding the birds, the indigenous terrestrial vertebrate fauna appears to be comprised in five species—a Rat and four Lizards." The Enteropneusta, which comprised two species, form a subject for truly biological treatment by Mr. Jas. P. Hill, and the Mollusca are naturally taken in hand by Mr. Hedley, who is the Conchologist of the Australian Museum.

In a summary of the fauna we read: "Prior to the advent of the Expedition, not more than eight species of animals were recorded in literature from Funafuti"; these published lists now "embrace about eight hundred and fifty entries." Zoologists will congratulate all concerned on the good work done, and those who study zoo-geography will value the volume.

The Norwegian North Polar Expedition, 1893–1896. Scientific Results. Edited by FRIDTJOF NANSEN. Vol. I. London, New York, Bombay : Longmans, Green & Co.

NANSEN's voyage in the 'Fram' is well known to the many English readers who have perused 'Farthest North.' But, beyond geographical exploration, natural science was also deeply interested in this boreal expedition, and the results achieved are now receiving publication in a handsome and complete form, of which the first volume is before us.

The first contribution is by Dr. Pompeckj, on "The Jurassic fauna of Cape Flora," which, as Nansen informs us, "situated in circ. $79^{\circ} 56'$ N. lat. and circ. $49^{\circ} 40'$ E. long., is the western extremity of the long and narrow peninsula which forms the south-western part of Northbrook Island." Unfortunately the fossils examined were generally in a very imperfect condition, but some complete work even under these circumstances was accomplished, and a fauna of at least twenty-six forms demonstrated as occurring in the Jurassic Sedimentary Rocks collected by Nansen in the Cape Flora district. Among the peculiar features of the fauna may be just mentioned the "prominent part which the Ammonite genus *Cadoceras* plays in its composition"; while in all the known fossils from the marine jura of Cape Flora, the Gastropoda are represented by a single specimen only. The Callovian fauna Dr. Pompeckj reports as "*nothing but a part of the fauna of the Russian Callovian.*"

The description of the "Fossil Plants" are outside the province of this Journal, and we pass on to an account of the "Birds," by Prof. Collett and Dr. Nansen, the first named of whom has contributed the strictly ornithological matter, while the second has added personal observations. This contribution is eminent by a very full account of the Roseate Gull (*Rhodostethia rosea*), referred to in more than one place, and in its juvenile first plumage forming the subject for a very beautiful chromo plate:

The Crustacea are described by Prof. Sars, and, when this excellent authority receives sufficient material, we all expect a banquet in biological information, and we are not here disappointed. We read: "As is well known, it has until recently been the general assumption of geographers, that the Polar basin, north of Siberia and Franz Josef Land, could only be quite a shallow sea, with depths scarcely exceeding some hundred fathoms, and the zoological equipment of the 'Fram' Expedition was arranged in accordance therewith. But, in direct contradiction to this generally adopted view, that part of the Polar Sea through which the 'Fram' drifted with the ice proved to be everywhere of enormous depth, exceeding in this respect even the Norwegian Sea." Although it is probable that there is very little animal life on the bottom in this part of the ocean, it was remarked that

the more superficial strata of the sea, though almost perpetually covered with a layer of ice, were found to abound with life, at all seasons, and in the most northerly altitudes reached. But Prof. Sars is of opinion that these pelagic animals are not strictly confined to the more superficial strata of the sea, "but that they also at times descend to considerable depths, perhaps even to the strata immediately covering the bottom." Forms also hitherto regarded as southern in distribution have been found in the Polar Sea; in the pelagic Copepoda, a Calanoid, of the genus *Hemicalanus*, hitherto only recorded from the Mediterranean and the tropical parts of the Atlantic and Pacific Oceans, being a case in point. Thirty-six plates illustrate this contribution.

Text-Book of Palaeontology. By KARL A. VON ZITTEL. Translated and edited by CHARLES R. EASTMAN, Ph.D. Macmillan & Co., Limited.

It is perhaps as difficult to imagine a science of zoology divorced from the past in palaeontology, as a form of theology without any reference to a future existence, or a history strictly confined to modern events alone. Palaeontology is one of the great witnesses to the truth of organic evolution, which we all regard as the philosophy of natural history.

This is not merely a translation, but rather an adaptation of Zittel's 'Grundzüge der Palaeontologie,' for though the chapters on Protozoa and Coelenterata stand essentially as in the original, "nearly all the remaining chapters have been remodelled, enlarged, and brought as nearly as possible up to date by a selected body of experts." The 'Grundzüge' itself was published as recently as the spring of 1895, and, although radical departures have been made with the author's sanction, "one must by no means presume he is thereby committed to all the innovations which are set forth." No fewer than twelve collaborators have assisted the editor, so that a "new and revised edition" is perhaps necessary to be added to the term "translation."

The present volume is devoted to what are usually considered "the lower forms of life." Seven "Sub-Kingdoms"—to use the term employed—are described, *viz.*: Protozoa, Coelenterata,

Echinodermata, Vermes, Molluscoidea, Mollusca, and Arthropoda, the Vertebrata being reserved for the next volume. In the introduction we are reminded how even in palaeontology we have advanced beyond the Linnæan and Cuvierian conceptions, when we read: "Those holding to the theory of descent, evolution, or transmutation, look upon varieties, species, subgenera, genera, families, orders, classes, and sub-kingdoms, as distinctions of merely transient importance, corresponding to the state of our information at the present time; it being assumed that by means of gradual transmutation during the course of ages all organisms have become evolved from a single primitive cell, or from a few primitive types."

This excellent German work, made accessible to the strictly English reader under purely American supervision, forms a work of reference that zoologists will find most useful to consult. Even with its more than 700 pages of letterpress, containing 1476 figures, its subject matter is very far from exhausted, and its value lies in its summarized information. This is evident when we refer to the Insecta, revised by no less than the greatest palaeontological authority on the subject, Prof. S. H. Scudder, and find that the information is compressed in ten pages. Those who are familiar with the palaeontological writings on this subject by Prof. Scudder alone will not fail to comprehend that even this portly volume is but a digest of the ancient history of animal life.

An Elementary Course of Practical Zoology. By the late T. JEFFERY PARKER, D.Sc., F.R.S., and W. N. PARKER, Ph.D. Macmillan & Co., Limited.

HOWEVER much in our daily life we may somewhat avoid the too practical man, there can be little doubt we want more practical zoologists. The average naturalist to-day is perhaps concerned overmuch with the outsides of animals, and a very large proportion indeed of conclusions and theories are based on animal appearances. Surface zoology in a strict sense should rank very little higher than surface geology; but how few of us have now either the time, opportunity, or desire for undertaking even

ordinary dissection. This volume is an incentive to make us really understand all that can be practically learned about a few typical animals, and the thorough mastery of the anatomical and physiological details of these living forms will leaven the whole lump of many zoological conceptions. In fact, as the author states—for one only is now left—“Throughout the book I have borne in mind that the main object of teaching zoology as a part of a liberal education is to familiarise the student not so much with the facts as with the ideas of the science.”

The first thirteen chapters are devoted to the Frog; attention is then paid to some of the most primitive forms of animal life, after which the objects of study are those familiar “zoological models,” the Earthworm, the Crayfish, and the Fresh-water Mussel. A few illustrations of the Vertebrata follow, and the concluding chapter is chiefly of an embryological character. In the summary of views respecting the subject of organic evolution we meet with an advice which we do not remember having seen elsewhere:—“As a preliminary to the study of Darwin’s ‘Origin of Species,’ the student is recommended to read Romanes’ ‘Evidences of Organic Evolution,’ in which the doctrine of Descent is expounded as briefly as is consistent with clearness and accuracy.”

*General Index to Miss Ormerod’s Reports on Injurious Insects,
1877 to 1898.*

*Report of Injurious Insects and Common Farm Pests during the
Year 1899, with Methods of Prevention and Remedy.* By
ELEANOR A. ORMEROD, F. R. Met. Soc., &c. Simpkin,
Marshall, Hamilton, Kent & Co., Limited.

DURING a period of twenty-two years Miss Ormerod has issued her Annual Reports on Injurious Insects. The quantity of valuable information, thus one may almost say interred, except to the diligent readers of these reports, is now accessible to all by the publication of an excellent index compiled by Mr. Robert Newstead, himself well acquainted with the subject.

The twenty-third Report for 1899 commences a second series, and is in no way inferior to its predecessors. Miss Ormerod’s

"study" must be a veritable "Scotland Yard" for insect predators. Here an account is kept of all previous convictions, and the names, habits, and life-histories of all these agricultural criminals are accurately recorded and regularly published, while the most speedy and convenient methods for their destruction are studied and advised. We fear, however, that these annual reports are not sufficiently procured by our agriculturists, fruit-growers, and foresters, to whom they should prove indispensable; while all who take an interest in a garden—"and who loves a garden loves a greenhouse too"—will find aid in its pages to resist the attacks of many enemies. We sometimes scarcely estimate the size of these insect hordes which ravage our crops. One of Miss Ormerod's correspondents, a head-schoolmaster, relates that during the late season, when the larvæ of White Cabbage Butterflies made dreadful havoc among the cabbages and similar plants, he put two boys at a time during their dinner-hour, in his small garden of about a quarter of an acre, with a net to catch these butterflies, of which in *seven days* they caught and killed no fewer than 834. Again, from two hundred and forty plants the boys gathered more than 5000 caterpillars.

Insects alone do not curtail Miss Ormerod's work, and in this issue we have a most interesting account of the Snail-Slug (*Testacella haliotidea*), an animal which is labelled (Beneficial) "ridding us of small ground vermin; they are wholly *carnivorous*, and prey chiefly on Earthworms, but also on Slugs and Snails, and even on each other."

EDITORIAL GLEANINGS.

MR. A. SMITH WOODWARD, in this month's issue of the 'Annals and Magazine of Natural History,' has announced the discovery of an extinct Eel (*Urenchelys anglicus*) in the English Chalk. The writer observes:—“There is thus no doubt that the Apodal fishes date back to the Cretaceous period. . . . A well-preserved skull of a typical Eel from the Lower Chalk of Clayton, Sussex, is to be recognized in the Willett Collection in the Brighton Museum.”

AT a meeting of the Asiatic Society of Bengal, held at Calcutta in January last, Major Alcock exhibited some enlarged drawings of the well-known caterpillar of the Notodontid moth, *Stauropus alternus*, and remarked:—“These caterpillars, which can be found in Calcutta and its vicinity in the rainy season, are as extraordinary in look as they are in behaviour. When touched they turn the hinder end of the body over on to the back, in the manner of an enraged Scorpion, and then begin to tremble as if agitated by the most uncontrollable emotion. There are certain particularly irascible Ants that behave somewhat in the same way, and there can be little doubt that the suggestion which has been made that the attitude of the alarmed *Stauropus* caterpillar may be mistaken by its enemies for the offensive posture of an Ant of enormous dimensions is somewhere near the truth. The insects that accompany these drawings are common enough during the monsoon in Calcutta, and I recommend them to your further notice. No observer can watch their behaviour without admiration. Of their power to terrify creatures like birds, whose high æsthetic and emotional development cannot but be accompanied by at least the germs of superstition, there can be no uncertainty.”

Mr. de Nicéville, in criticising these remarks, considered that, although perhaps the “scares” might frighten birds, their most important function was to terrify ichneumon-flies and parasitic Diptera, which were far the most active enemies that caterpillars had to contend against. For this reason he thought that the more commonly received idea that the *Stauropus* caterpillar, when irritated, resembled a Spider was nearer to the truth.

WE have received the Report for the year 1899 relating to the Ghizeh Zoological Gardens, near Cairo, by the Director, Stanley S. Flower, F.Z.S.

The mammals, birds, and reptiles contained in the collection on the 6th October, 1899, comprised 473 specimens and 132 species.

In addition to the above, there are many animals living at large in the Gardens, which form one of the chief attractions of the place. Great care is taken to encourage the wild birds, and their numbers seem to have increased considerably during 1899. The most noticeable of these birds are :—

- Song-Thrush (*Turdus musicus*).
- White Water-Wagtail (*Motacilla alba*).
- Grey-headed Yellow Water-Wagtail (*Motacilla cinereocapilla*).
- Common Sparrow (*Passer domesticus*).
- Hooded Crow (*Corvus cornix*).
- Kingfisher (*Alcedo ispida*).
- Pied Kingfisher (*Ceryle rudis*).
- Hoopoe (*Upupa epops*).
- Grey-headed Love Bird (*Agapornis cana*).
- Barn Owl (*Strix flammea*).
- Southern Little Owl (*Carine meridionalis*).
- Kestrel (*Tinnunculus alaudarius*).
- Egyptian Kite (*Milvus aegyptius*).
- Grey Heron (*Ardea cinerea*).
- Night Heron (*Nycticorax griseus*).
- Wild Duck (*Anas boscas*).
- Common Teal (*Querquedula crecca*).
- Turtle-Dove (*Turtur senegalensis*).
- Stone-Curlew (*Œdicnemus crepitans*).

AUSTRALIAN ornithologists—a body of students which, we believe, is increasing—will doubtless appreciate ‘A Key to the Birds of Australia and Tasmania, with their Geographical Distribution in Australia,’ by Robert Hall. A beginning is made with 767 known species, but assuredly many more are to be discovered in this wide, and in many parts little-worked, area. A short description is given of each species, and the value of the list would have been much enhanced if a reference to the publication of the original description had also been given. This publication is in convenient form for pocket reference, and we should have greatly valued a similar compilation when collecting in other parts of the world. It is published by Melville, Mullen & Slade at Melbourne, and by Dulau & Co., London.

PROF. C. O. WHITMAN has reprinted and issued in a separate form his lecture on “Animal Behaviour,” delivered at the Marine Biological

Laboratory, Wood's Holl, Mass., U.S.A. Some most valuable and interesting observations on the life-histories of Leeches (*Clepsine*) are detailed, though the publication is mostly of a philosophical character. Special emphasis is devoted to the view "that instincts are evolved, not improvised, and that their genealogy may be as complex and far-reaching as the history of their organic bases."

WE have received from our contributor, Prof. J. H. Salter, a "List of the Birds of Aberystwyth and Neighbourhood," published by the University College of Wales Scientific Society. We need scarcely observe that such lists are highly valued by ornithologists, especially when compiled by competent authority, as is done in the present instance.

MR. L. UPCOTT GILL has again produced his annual 'Naturalists' Directory.' The publication for 1900 is far in advance of its predecessors. We no longer notice the absence of so many well-known names, though we think a reference to our pages could increase the number of British zoologists. The List of Societies, Field Clubs, and Museums is a welcome feature of this inexpensive and very useful handbook.

THE death is announced, in his eighty-sixth year, of Canon Atkinson, the well-known author of 'Forty Years in a Moorland Parish,' a delightful volume which was published some nine years ago. He had held the living of Danby-in-Cleveland for nearly three years over the half-century, and during his incumbency he calculated that he had walked 70,000 miles whilst engaged in clerical work. He was a naturalist, an antiquarian, and a sportsman.

WE also regret to record the death of Dr. St. George Mivart, which occurred on April 1st, at the age of seventy-three. The deceased was a zoologist who was best known as a polemical writer, his 'Genesis of Species,' though anti-Darwinian, being recognized by Huxley as worthy of combat, and who described Mivart as "less of a Darwinian than Mr. Wallace, for he has less faith in the power of natural selection. But he is more of an evolutionist than Mr. Wallace, because Mr. Wallace thinks it necessary to call in an intelligent agent—a sort of supernatural Sir John Sebright—to produce even the animal frame of man; while Mr. Mivart requires no Divine assistance till he comes to man's soul." Dr. Mivart, as before mentioned, was an accomplished zoologist. To the "man in the street" he will be remembered by his recently published differences with the Roman Church, with which he had been long in communion.

